

ABSTRACTS OF

The Milroy Lectures

ON

THE TEACHING AND TRAINING IN HYGIENE:

SOME CRITICISMS AND SUGGESTIONS.

By H. R. KENWOOD, C.M.G., M.B.ED., D.P.H., F.R.S.E.,

CHADWICK PROFESSOR OF HYGIENE, UNIVERSITY OF LONDON;
M.O.H., STOKE NEWINGTON, ETC.

LECTURE I.:

THE HYGIENIC TRAINING OF THE SCHOOL CHILD.

MR. PRESIDENT, LADIES, AND GENTLEMEN,—Dr. Milroy was deeply concerned with the betterment of public health, and he endowed the lectureship which I have the honour of holding for this year in order to stimulate research and suggestions to this end. Alive, as he always was, to the importance of the formation of hygienic habits, and to the necessity for the best work of public health practice and research, and realising that these ends can only be achieved through efficient training, he would have agreed that the subject of "The Teaching and Training in Hygiene" is one of prime importance, and properly falls within the objects of the lectureships which he founded. But may I add that I did not select this subject solely because of its great and pressing importance; I was greatly influenced by the consideration that my 25 years' experience, not only as a teacher of hygiene and public health, but also as an examiner at many centres and as a public health official, qualified me to deal with it. I have taken the precaution of testing the views of a large number of experienced workers; and the fact that I find myself in close agreement with almost all of them confirms me in the suggestions and criticisms which I shall venture to offer in these lectures.

NEED OF SOCIAL AND SCIENTIFIC RESEARCH.

The time is opportune for revising the old and devising new schemes for better training. The State has never stood in greater need of the best services in the interests of public health. Indeed, we are approaching an era which will be characterised by better directed effort in a hundred-and-one activities. With an increased willingness to act and a diminished capacity to spend, there will be after the war a very critical inquiry into actual and relative values; and it may be expected that as a result some modifications of our existing public health schemes will result. For at present we fail gravely to make the most of our knowledge of how to prevent avoidable sickness, and much of public health endeavour is misdirected.

We are still ignorant of the cause of many ailments; and so much organised research by well-trained workers is demanded. The type of research needed does not involve pure science alone, but, also the sociological side of public health, in which connexion comprehensive investigations are called for. But such social research must be undertaken by those who have the scientific spirit of inquiry, and who do not start upon it with a preconception or bias and to strengthen a particular viewpoint.

At every step along the path of progress and experience in our child welfare work, for instance, we are learning how wide-spread among the conditions adversely affecting the social life of the people are the indirect contributory causes of ill-health among our infants and children; and hence how much more complex and difficult than we once contemplated is this public health problem.

IMPORTANCE OF EDUCATING THE COMMUNITY.

The outlook on public health problems 30 years ago presented a very striking contrast to that of the present day. The public health activity of sanitary authorities in those days paid little heed to the individual and spent itself upon environment. This was conceived to be the main factor in determining health; and the origin of most infectious diseases was sought for in the defective sanitation of the home premises. Now we have turned to the individual factor as of prime concern; and our modern public health policy is becoming more and more an educational campaign—for above all the community needs knowledge. The most effective branch of public health work in which we have

been engaged for some years is that concerned with the reduction of infant mortality—and this is for the reason that it is mainly *educational work*, of a direct and personal nature, among the ignorant and the careless.

It is therefore necessary to develop to the utmost the *educational* means at our disposal, for if we go to the root of matters there is but one remedy for most of our social evils (including preventable ill-health) and that is education. While the larger activities of public bodies can assist, the full betterment desired can generally only come through knowledge which the individual himself will apply to his own intimate circumstances.

As the intimate social circumstances of the community present the main difficulties with which we have to contend in our efforts to reduce the misery and economic loss that ill-health entails to the State, the gaze and the hope of hygienists have long been directed towards our schools; for it is recognised that the physical and moral hygiene of the community is mainly dependent upon that early education and training which develops individual desire and initiative.

The provision of a suitable hygienic training at school—the only time when all the citizens are under control for training—is the logical outcome of the appreciation of the above facts, and the essential importance of this demands that I shall devote my first lecture to it.

To indicate the matters relating to their physical well-being which nowadays should be common knowledge among the people would necessitate a statement of considerable length; but allow me to illustrate this demand upon education by a brief reference to the two great problems which sanitary authorities are still endeavouring to solve—the problems of a pure milk-supply and of hygienic housing.

We have heard a great deal in recent years of the need for clean milk. It has been found that legislation and sanitary supervision are but very partial remedies for dirty milk; and everyone who has an intimate knowledge of all the facts shares the view that an essential factor in the solution of the milk problem is the education of the people. The key of the situation is in the hands of the public, who, by failing to demand clean milk and by allowing it to get so much contaminated in the home, are mainly responsible for the evil consequences of dirty milk. There is no sentiment in commercial matters; public demand and competition govern everything; and if once a demand for clean milk became fairly general it would be met by the trade.

Again, will anyone of experience contend for a moment that the evil effects of bad housing are not *mainly* under the control of the tenants themselves? The most effectual cure even for bad landlords is better tenants. Insanitary environment is mainly the product of the man, and individuals without hygienic habits are but little benefited by sanitariously constructed premises. Much of "housing reform" can scarcely be justified unless greater efforts are made to reform the occupants.

There can be no doubt, then, that an increased effort to cultivate "a health conscience" among the masses is the most powerful agent for promoting public health that we possess. It is equally certain that we must start with the child. To equip a child for all his duties, personal and social, in after life, correlational links must be established between lessons and life, the school and the home, the home and the community; in no matter is this so important as with hygienic teaching and training.

So much of a child's lifetime is absorbed by school that hygienic training, even in the best circumstances, must be carried on in the school as well as the home. In many cases, however, the child is entirely dependent on the school for his defence against future physical and moral ills. The most necessitous are the children in poor districts, and so I am mainly concerned with those in our elementary schools, and here I propose to confine myself to considerations as to their training.

A LOOK INTO THE FUTURE.

We are advancing in measured steps towards a goal which can only be discerned in dim outline—the goal of a community well trained in hygienic practice and the performance of domestic duties; and, with conceptions narrowed perhaps by the limitations of our present-day outlook, let us endeavour to foresee something of what those who are privileged to make a close scrutiny later on are likely to witness—in that Utopia which always lies just ahead of would-be reformers.

In the elementary schools hygienic training is as general as the teaching of reading and writing, and its importance appeals alike to teachers and parents. It is now regarded as an anomaly that a school teacher should ever have been permitted to act without some knowledge of hygiene, for if we know nothing of the laws of life, the nature of a child's physical and mental development, and the varying requirements of the developing organism we can hardly achieve its education.

In order to secure for medical inspection a practical remedial outcome certain parents had long been appealed to by school teachers, school nurses, and members of school care committees, and even admonished and penalised by magistrates in order to secure medical treatment for the school child. The policy of securing this maximum parental coöperation grew to be regarded as no less applicable to the educational treatment of the child; and equally necessary to the moral and hygienic training of a large proportion of children. To promote this the Board of Education issued a simple statement to parents, indicating the respects in which their coöperation is needed in the training of their offspring, and adopted many measures to stimulate them to this end.

Thus, under a successful scheme of linking up the school with the home, school teaching and training became more real in the eyes of the masses, and parents grew to more closely ally themselves with the school teacher and the physician in their common aim; and so wastage (mental, moral and physical) in the nation's stock was greatly reduced.

Better training in hygiene was promoted by the raising of the age of compulsory school attendance to 15. It would now be regarded as a criminal act to free a child from trained educational influences at 14—for the lessons then leave off when most needed, and when the power of really grasping much of which is of vital concern has only just set in. There has been a great increase in the number and equipment of technical institutes and continuation schools, at which attendance is compulsory and the teaching of domestic economy, child welfare, and hygiene, is continued. This great concentration of effort directed towards the moral and physical welfare of the child is a very marked feature of development to be noted. This solution of many social difficulties was always knocking at our doors, while we were round the corner looking for other remedies; and experience has proved that, generally speaking, if we properly look after the child the adult looks after himself.

And what is a very evident result of this policy?

The community is now much more intelligent and sympathetic on health matters, and self-knowledge and self-control have grown apace. It helps itself in a hundred-and-one ways where formerly it required administering to.

It is now realised that the all-important matter of public health demands the intelligent coöperation of the whole community. Generations of men and women, who knew what they were talking about, went down to their graves seeking to impress all this and advocating the adoption of the obvious remedy. Owing to the exigencies of party politics all sorts of vote-catching measures took precedence, but it came at last. And now nothing is more remarkable than the independence of the masses and the absence of much of the well-intentioned but ill-directed energy which once obtained. The people have the simple knowledge and training which have so greatly contributed to their health and comfort that they have become convinced hygienists, and so every sanitary problem became greatly simplified.

Great and general as the improvement is, the community has not reached the stage at which indifference, folly, or crime cease to claim some toll of mental and physical incompetence, preventable sickness, and mortality; so that at the distant goal which I scan I see similar problems to those confronting us at the present day, but problems of much reduced proportion. And I can discern a fundamental difference in the line of treatment adopted. The bed-rock circumstances responsible for social maladies are better recognised, and more energy and money are devoted to the radical cure and less to the alleviation of symptoms. With the marked reduction of poverty and ignorance, as the result of better school training, the tinkering with these problems, once so much in evidence, has disappeared in my Utopia.

THE PRESENT POSITION.

And now let us turn to the present-day realities and see what advance we are making towards the desirable goal that I have indicated, and then consider with me whether it is not possible to straighten our course and expedite our steps towards it.

In 1904 a petition signed by more than 14,000 doctors was presented to the Board of Education, urging the teaching and training of hygiene in elementary schools; and in 1906 a large deputation of the British Medical Association and other bodies presented a memorandum to the President of the Board, in which the opinion was expressed that—

“The teaching in hygiene and temperance in public elementary schools is essential for the development of the well-being and happiness of the nation at large.”

A provisional syllabus for the instruction of teachers was submitted, and also a scheme of the lines on which instruction should proceed in public elementary schools. It seemed to me at the time that both the syllabus and the scheme made too great a demand upon the teachers and the taught; and that while possessing many excellent features, the scheme was, in its reference to matter which should be taught to elder children, more suitable (from the standpoints of its scope and comprehensibility) to the teacher than to the elementary school child.

In 1906 the Board of Education published a suggested scheme for teaching hygiene and temperance to the scholars attending public elementary schools. This scheme possesses some admirable features: it embraces many of the suggestions of the medical scheme above referred to, but it is far less

ambitious. But despite the fact that the Board has drawn attention to the “paramount claim” of hygiene, and to the fact that “the proper teaching of hygiene is most urgently called for” (1906), the Code of Regulations of the Board for Elementary Schools in England, can as yet only *advocate* such instruction. This is not due to any lack of appreciation of the prime importance of the subject. Indeed, the Board has greatly promoted hygienic *observances* at school and has made a general provision for physical exercises, but it has been difficult to provide a sufficiency of suitably trained teachers.

So, as there are still many teachers in the elementary schools throughout the country who have not received any training in hygiene, it follows that there are many elementary schools, especially in rural districts, in which no training (apart from the correction of dirty habits and conditions and the object-lessons of the school premises) is provided for the children. In those schools where hygiene is now being taught, though good intentions are not lacking, the objective is not being reached in a large proportion, and these poor results are due to the unreality of the teaching.

I have interviewed many head masters and head mistresses of elementary schools wherein it is *claimed* that hygienic teaching and training are provided, and I find myself unable to attach real value to most of it. The teacher's mental attitude towards the subject varies. Generally speaking, it is more sympathetic among the women than among the men, and there can be no doubt that girls come off better than boys in the matter of hygiene. Some are openly intolerant and attach little, if any, value to it; others are more sympathetic, but would accord hygiene a no more prominent place than that which it can find, incidentally, in the training in domestic economy or elementary science; others base a claim for hygienic instruction on nothing more than the correction of bad habits and occasional remarks; many others find time for some special training in hygiene, and of these some work to a practical and simple scheme, while others cloud the issues in a crude and artificial syllabus which must lead to utter confusion.

Where hygiene is treated as a separate subject the boys and girls generally receive some instruction from Standard V. upwards. The instruction in domestic science and housewifery for the older girls (a most valuable provision) is much more general; and as here is the only opportunity of impressively illustrating some essential facts of domestic hygiene the teachers should be qualified in this latter subject.

The problem of supplying a useful training in hygiene to every elementary school-child is a difficult one, but, as Democritus has said, “There is but a single way of making great difficulties small—that of looking them straight in the face.”

AIMS OF TRAINING IN HYGIENE.

Let us first consider the object of this training and its appropriateness to an educational scheme. The training in the ordinances of healthy life is now generally recognised as an essential part of citizen training. As Elkington has so well said—

“Hygiene is a subject which fulfils admirably the teaching requirements of seeing, reasoning, and remembering; it lends itself to both training and instruction; and possesses high material and ethical value. When it is added that the fullest regard must be paid to the physical health of the child in order to obtain the best mental reaction, it must be admitted that hygiene is a close and natural ally of the pedagogue.”

The school age is the age of habit-formation; and the establishment of good habits, promoting physical and moral health, is the chief concern of hygiene. No later admonitions from any source, no intimate knowledge later acquired, are of such value as those “memories of the lower centres” which may be so readily grafted on the child. Equally are these the years of character formation; and so during the school age the individual is in no small measure either made or marred.

Firstly, permit me to state a few principles with reference to hygienic training in its application to elementary school children before I outline the simple scheme for such training that in my judgment would best meet the case.

STATEMENT OF PRINCIPLES.

Hygiene has been well defined as the “Gospel of bigoted cleanliness.” A child trained in cleanly ways of action and of thought will resent dirt at home, will carry with him a far stronger safeguard against dirtiness in his habits and a greater measure of self-respect than if he were carelessly and

laboriously provided with a complete and admirably designed panoply of aphorisms intended to meet every thinkable contingency in school life and afterwards. Now those who have had experience entertain no doubt that the poorer children of this country are far cleaner to-day than they were 10 years ago. It is certain that school agencies are mainly responsible for this valuable result. But has it been obtained by teaching? Certainly not. It has been secured by corrections and object-lessons. It is hygienic practice that is needed; and as to precept, it is sufficient to point out in the simplest possible language the good that comes from obedience to the laws of health and the harm that comes from neglecting them. Certain rules and facts have to be applied in a common-sense way to every-day life and environment, and so, in the training of the school child, an eye must be kept on the actual circumstances and needs of the home. We must seek to develop "a health conscience" by checking bad habits and encouraging good ones. *That is the goal of our hygienic training at school.*

If we could secure that every teacher was a skilled and keen *trainer* in hygienic observances little more would be needed; and I hold the view very strongly that average girls and boys up to 14 years of age are likely to take but little active interest in their own bodies by *teaching* them hygiene.

When the elementary school teacher informs me that hygiene is taken in elementary science I conclude that probably nothing of real service is being done from the standpoint of hygienic training. It means that there is "no time" for it, and so it is shelved in the elementary science laboratory. I do not know why hygienic training for elementary school children should be treated as a science subject any more than housewifery; for them hygiene is essentially an art—the art of healthy living. The science of hygiene is not for young children; to treat it in elementary science is to obliterate it.

Nothing more than simple statements upon the laws of healthy living should ever be made, and these only for those in the last two standards; explanations must be plain, simple, and direct, and not befogged with any unnecessary details; and there must be no elaboration or artificiality of material used—it must be simple, familiar, and practical. To illustrate my contention: It would be a stupid waste of time and faulty in principle to attempt to teach scholars under 14 years of age the composition of the air, the structure of the lungs, and the mechanism of respiration in order to impress upon them the importance of fresh air; rather should they be told something of the results of common experience and be trained by the object-lesson of the open window and the maintenance of fresh air conditions in the class-rooms.

School teachers ask for some scheme which will encroach as little as possible upon an already over-burdened school time-table. But if nothing is dealt with but what is of real practical value to the scholar; if we do not make the mistake of calling simple things by elaborate names and of attempting to treat on a scientific basis facts which stand in no need of such treatment; and if this training is spread over the whole school curriculum, it should make but little demand upon the time or energy of the teachers, either in acquiring the necessary knowledge or in communicating it to the children.

SUGGESTED SCHEME.

What, then, is the suggested scheme for obtaining the best possible results under the restricting conditions imposed by an already crowded syllabus and the early ages of the scholars? The practice of hygiene and its precept should permeate the whole school life. Up to and including Standard III. I would advocate nothing more than the *training* by object-lessons and corrections, but in Standards IV. and V., in addition, the nature and importance of the laws of health should be simply and tellingly impressed in occasional short talks, which will never seek to do more than to produce a particular practical result in training. The ever-present aim would be to *train*, and all efforts would be focused on that.

The aim of these incidental talks would, where possible, be impressed upon the scholars by means of object-lessons (as, for instance, the correction of a dirty boy, the correction of a dirty habit, the opening of a window, &c.), or an introductory story may sometimes serve. All technical or scientific terms would be avoided in these talks, which would always be illustrated by facts and objects which fall within the range of school and home life. Simple sanitary devices would be

illustrated upon the school premises, and their uses explained; and some of the pictures and texts on school-room walls should relate to hygiene—for "the memories of children are mainly visual, and the visual picture of the school-premises often forms an unconscious example in after-life for guidance."

These short, informal, homely talks, would be carefully graduated so as to appeal to the different standards.

It is the general experience that young scholars are far more impressed by a talk than by a set lesson; and if the brief conversational digression is introduced during the time allotted to a set subject, as an impressive opportunity occurs, it rivets attention and has almost a recreative value. As repetition is necessary to lasting impressions, questions would be asked (and invited) from time to time; and if something has to be done, each student should be made to do it.

Attention may here be drawn to the correlation of hygiene with certain school-subjects. In this way the teacher who is alert can find opportunities of instilling the lessons of hygiene; and they can be set for the weekly compositions, which are now, very properly, a part of the scheme of elementary education—in which case an early opportunity would be taken, in a supplementary talk, to deal with facts which do not appear, from the compositions sent in, to have been sufficiently grasped.

I would advocate nothing more than the above scheme for *boys*, even in the higher standards, if it could be guaranteed that all school teachers would be keen and alert to make the most of the foregoing scheme; but I realise that it is *policy* to put hygiene on the school time-table, as a set subject, for the last two years. Thus, the training of boys and girls during the last two years would be carried a step further. The subject would be taught (on purely practical lines) as hygiene, and not cloaked in any other subject—certainly not in Elementary Science, and it would not demand more than two half hours a week.

Nothing is more impressive to the scholars than when one of their number is singled out for some special duty. It would therefore be a most telling means to our end if a scholar in each class-room occupied by children over 10 years of age were constituted the "sanitary monitor" for the week. It would be his duty to see that the ventilators were open, that the class-room was well flushed with fresh air upon every available opportunity, to report if cleanliness did not obtain, if dust had accumulated, and if all sanitary demands were not met in the use of the sanitary conveniences provided. Such practices have a wonderful educational effect because they are so impressive. The Board of Education favours the school sanitary monitor, and even recommends "an occasional practical lesson of cleaning," but he is not to be seen in the majority of schools.

Though I am not an advocate of "Health Readers," each child might usefully be provided with a short printed list of rules for his conduct at school, at play, and at home; and these might be explained by the school teacher as occasion permitted or circumstances demanded.

The training of a child in the right way of doing the right thing, coupled with his natural assertiveness, will generally ensure that much useful practice is transferred to the home. But in special cases the coöperation of parents in the home should be enlisted, either by the school teacher, or by the assistance of others who are working in the cause of child-welfare.

GROUND COVERED BY THE SCHEME.

A suitable detailed scheme requires to be prepared with great judgment if it is to be kept at once elementary and practical. The ground covered by such a scheme should comprise—

(A) Training in formation of hygienic habits, including presentation of hygienic object-lessons.

(B) Simple statements upon elements of personal and domestic hygiene.

(C) Additional training for elder girls. The training in the duties of keeping the home (including food catering, marketing, and cooking; laundry work; needlework; and care and management of children).

Under (A) the training would permeate the whole school life.

It would demand correctional observations or talks, suitably graded to the standards. All scholars will be maintained at a fair standard of cleanliness of skin, nails, hair, teeth, and clothing. (The necessity of a weekly wash and change of underclothing will be impressed; dirty scholars will be sent to the lavatory and, if necessary, shown how to cleanse themselves; bad and dirty habits—namely, spitting, bad posture, untidiness, &c.—will be corrected. If school meals are provided, clean hands, good chewing, the drinking after the meal, and avoidance of waste will be inculcated.)

Object-lessons of the school premises would embrace cleanliness and cleaning, tidiness and brightness, the open window, the proper state and use of lavatories, closets, &c.

The set teaching and training under (B) would be restricted to the last two standards.

Simple instruction and advice would be given on the following matters:—

Dirt: its dangers (communicable disease is due to invisible dust, or "germs"). Dirt on the body and in the home—the need for its frequent removal; the cleaning of rooms (damp dusting); the burning of organic refuse in the home.

Air: Dangers of dirty and stuffy air; the importance of maintaining through-ventilation in living and sleeping rooms—the simple means of providing for this; overcrowding; foul odours—their sources and dangers.

The evil effects of bad lighting.

Water: How to avoid contamination in the home and its precincts.

Food: The necessity for fresh and untainted food—conditions of proper storage, need of cleanly utensils for food and drink, temperance in food and drink, the dangers of alcohol.

Dampness of dwelling, bedding, &c., and its evils.

Vermin on body and in home, preventive measures and remedies.

The elementary facts as to the nature and care of sanitary fittings requiring periodical attention (dust-bins, gullies, traps, sinks, water-closets, and earth-closets in rural districts). Simple references to duties of individuals in respect to the health of the community, and to the ways by which the sanitary authority endeavours to guard the peoples' health.

How infectious disease spreads, precautions to be taken.

What has been commenced in the manner indicated should be extended and supplemented by more formal and slightly advanced treatment in the Higher Elementary, Secondary, and Continuation Schools.

THE TRAINING OF THE TEACHER.

A teacher must be taught both how to maintain hygienic conditions at school and how to train the school child to hygienic observances; and this must be kept in view in arranging his training. In recent years the Board's final examination for students in training colleges has included a paper in hygiene, and the Board has drafted a model syllabus of the course of training in this subject; but alternative syllabuses may be approved of.

The model syllabus is solely intended to familiarise the future teacher with the general principles of hygiene, with the view to their practical application by him in the interests of the children. This guiding syllabus is very helpful and the advice offered is excellent; but I would presume to suggest that it is capable of some reduction without the school teacher losing any practical value from his study of the subject. But he is generally more efficient in maintaining hygienic conditions at school than in training and teaching the school children; and it is in this latter respect that his training lacks reality.

In common with many colleagues whom I have consulted I find, generally speaking, that the knowledge of hygiene among school teachers who have been trained in the subject is *unpractical* and *unreal*; it is essentially theoretical, and lacks appreciation of the relative importance of the numerous facts that have been acquired. It is essential that we do not lose sight of the facts that the maintenance of hygienic conditions at school, the training of children in hygienic observances, and the simple hygienic precepts suitable to the elementary school child, only demand a small amount of real, practical, and clearly arranged knowledge; and if the training were more directly based on these considerations the practical issues would not be so overshadowed as at present. Figuratively, the school teachers now lose themselves in the maze of facts which they penetrate but do not sufficiently explore; and the best remedy that I can suggest, having regard to all the circumstances (more especially those of the crowded time-tables both at the training college and the elementary school), is not to carry them much beyond the essential facts of value in practical application.

But a mere didactic statement of these facts will not suffice for the teacher's needs; it is necessary to arouse interest, sympathy, and respect for the subject; and so with him hygienic demands must be scientifically justified, and the second-hand information from lecturers and text-books must be verified by experiment and observation. The teaching and training must be direct and practical; indeed, half of the time given to the subject should be devoted to practical work, and with his trained mind the teacher could assimilate much "short-circuit teaching." Moreover, the subject demands an intimate knowledge of, and a full regard to, the home circumstances of the class from which the scholars come, and it is essential that arrangements are made to provide this. By thus concentrating upon practical needs he will be able to direct his knowledge more successfully to the goal of training, and the detailed scheme and method of teaching and training the school child which I should be disposed to favour would be that of a well-trained and enthusiastic school teacher who has evolved (under the expert guidance initially given) the best working scheme under the restricting conditions of elementary education.

INFANT HYGIENE AND MOTHERCRAFT.

When and how are those upon whom later we shall depend to bear and rear healthy children to receive instruction in this important function? I must confess to some doubt upon the policy of providing any of this particular form of training before the age of 14 is reached. If we are to have the future mothers under control after the age of 14 I should much prefer that this training is provided then. But when *it is* provided for elementary school children under 14 the subject of infant care should be linked up with that of domestic economy, and the instruction should be given either by a specially qualified school mistress acting for a group of schools, or (better still) by a local official health visitor, where one can be found, who possesses (*praeceptor nascitur non fit*) the art of conveying some selected essentials of her knowledge to young girls.

The health visitor, or a special teacher giving part-time services at a child-welfare centre, can best make the necessary arrangements for illustrating this branch of training. Only a person with experience of infant care in its practical aspects, can properly assess the important facts to be demonstrated or impressed; and classes of not more than 30 should be informed at a weekly session of 30 minutes during the last half-year of compulsory school attendance. Each child must perform the practical work set out, and during the course questions should be set and the written answers used as indicative of the revision work demanded.

The equipment for much of this teaching will be little more than a large washable doll and a few articles that can readily be taken to the school or provided there; but a few of the lecture-demonstrations should, if possible, be given at a child-welfare centre, where a real baby can be handled.

I would make it compulsory upon all young females who attend the evening continuation schools (which are destined to be greatly extended in the near future) to obtain at the same time a knowledge of infant hygiene and mothercraft.

GUIDANCE OF BOARD OF EDUCATION.

We are aware of the keen interest which Sir George Newman, the Principal Medical Officer of the Board of Education, has always shown in provisions for the training of school children in hygiene and of the difficulties which have to be faced, and we have seen that good work has been done by the Board during recent years to promote progress in this direction. But for this training we are dependent on the teachers in the training colleges, and they must replace the faulty methods which are proving ineffective by those which are better designed to produce elementary school teachers who are practical and practising hygienists. The examination at the training colleges must also be better designed to test this practical training, and school inspectors must see that the scholars at the schools are receiving the benefits (*qua training*) of revised methods.

The Board of Education may be depended upon to lose no more precious time than is necessary in supplying the further guidance which experience has shown to be required in the training of school teachers to a greater measure of effectiveness in the hygienic training of school children, and so hastening the day when every elementary school child in the country receives the great benefit of a real training in this subject.

ROYAL SCHOOL FOR DEAF AND DUMB CHILDREN, MARGATE.—In order to assist education in lip-reading for sailors and soldiers rendered deaf through war service, the committee of the Royal School for the Deaf, Margate, have presented to the Ministry of Pensions, as a hostel for the period of the war, a furnished residence in the school grounds, fully staffed for domestic care and instructional purposes. A minimum charge for food only will be made from the supplementary pension allowances paid to the men who are willing to participate.

CENTRAL MIDWIVES BOARD FOR SCOTLAND.—At a special board meeting held at 50, George-square, Edinburgh, for the hearing of penal cases an investigation took place on a report by the Local Supervising Authority of the deaths of two patients from puerperal septicæmia. Two certified midwives appeared in answer to the charges of failure to send for medical assistance and negligence in keeping registers of cases, records of pulse, temperature, &c., as required by the rules, and the charges being proved the secretary was directed to remove the names from the roll of midwives and cancel the certificates.

TACHYCARDIA:

OBSERVATIONS UPON ITS OCCURRENCE IN THE ENTERIC AND OTHER FEVERS.

BY H. FAIRLEY MARRIS, M.R.C.P. LOND.,
MAJOR, R.A.M.C.

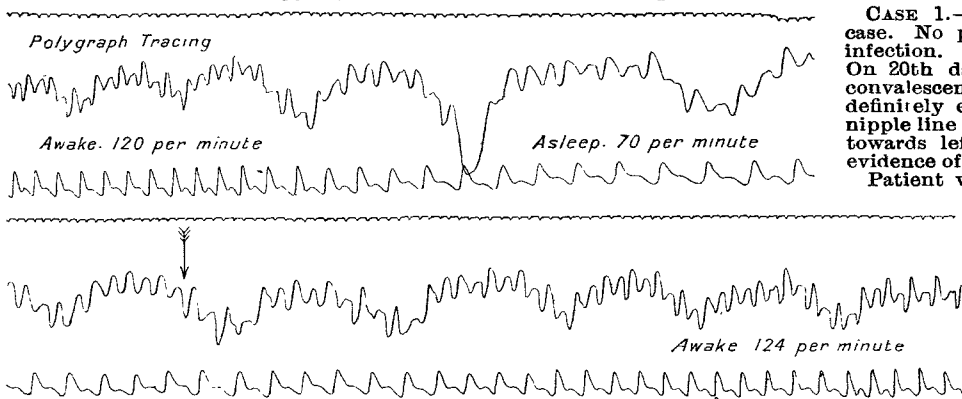
TACHYCARDIA occurring during the convalescence from the enteric fevers falls into three classes; each of these can be readily recognised by bedside observation, and thus appropriately treated.

During the last two years I have examined a large number of cases belonging to the enteric group of fevers, in many cases paying special attention to the heart-rate. The majority of these cases was characterised during the febrile period by a relatively slow heart-rate; some developed tachycardia *gradually* during convalescence, a few *abruptly*, whilst the minority were conspicuous by the presence of rapid heart action *throughout the disease*.

Scope of Investigation.

With a view to determining the nature of the tachycardia present the usual signs and symptoms of heart failure were

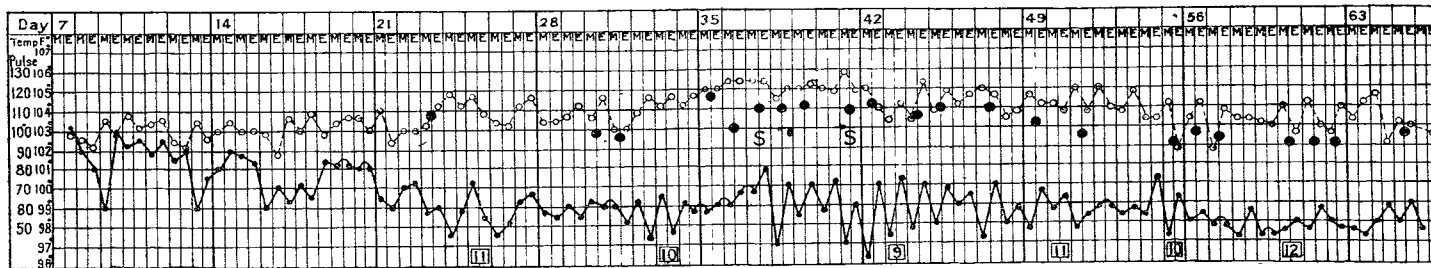
CASE 1.—Polygraph Record Awake and Asleep.



frequently sought for, the cardio-vascular system was repeatedly examined, and in addition further observations were made which appear to throw light upon this problem. These further observations will now be described, and the reasons given which led to their application. Briefly they are: the sleeping pulse-rate, arrest of respiration, localisation of apex beat of heart, and effect of posture upon heart-rate.

Sleeping pulse-rate.—A case under the care of one of my colleagues had been notified as having a persistent heart-rate of between 130 and

CASE 1.—Composite Chart of Temperature, Pulse, and Respiration.



Key to Symbols. Temperature — Pulse rate ○ Sleeping pulse ● S—Strophanthin gr $\frac{1}{200}$ Intravenously. Arrest of respiration in seconds eg [11]

140 beats per minute after an apparently mild attack of paratyphoid. Had been kept to bed for a month after commencement of convalescence; no diminution in heart-rate.

Careful examination failed to reveal any abnormality in size, sounds, or rhythm of heart; bases of lungs clear. Attempts were made to slow heart by compression over carotid artery and by draught of cold water with view to stimulate vagus nerve, but without avail.

The polygraph tracing was continued for a considerable time, when suddenly the heart-rate was observed to drop from 120 to 70 beats a minute. Respiration likewise slowed. *The man had gone to sleep.* (See tracing of Case 1.) The tracing was continued for a considerable time; then patient was quietly awakened, tachycardia and increased rate of respiration *immediately returned*.

In consequence of this observation, all cases showing rapid heart action frequently had the pulse-rate determined when asleep, and in this paper this observation will be referred to as the "sleeping pulse." A series of observations upon healthy men of between 20 and 30 years of age with an average waking pulse of 72, showed a sleeping pulse of 65 per minute.

Arrest of respiration.—Breathlessness has long been recognised as evidence of cardiac weakness, when such causes as morbid blood states and physical conditions or diseases of the lungs themselves have been excluded.

With a view to measuring breathlessness of patients the following method was employed. The period of time was accurately measured by the polygraph, during which the subject could suspend his respiration, beginning at end of quiet *expiration* and ending with next *inspiration*. This observation will be referred to as "Arrest of Respiration." Similar observations upon healthy controls showed this period to vary between 20 and 30 seconds.

Localisation of apex beat of heart.—The frequent difficulty in localising the apex beat of the heart in cases of the enteric group was quickly realised, and this observation will be fully dealt with in Case 3.

Effect of posture.—The effect of posture upon heart-rate was studied likewise the effects of a tight abdominal binder upon heart-rate, when in upright position. In health the assumption of the upright position usually causes a 10 per cent. increase in rate above that of recumbent position.

Description and Discussion of Cases.

Four types of cases showing tachycardia, upon which these observations have been made repeatedly, will now shortly be described and then discussed. In Case 1 the tachycardia is observed to arise in a permanently damaged heart; in Case 2 the tachycardia remains only while the heart is poisoned; in Cases 3 and 4 the tachycardia will be seen to be secondary to other causes.

Tachycardia Cardiac in Origin.

CASE 1.—True typhoid (*B. typhosus* in urine). Severe case. No previous history of cardiac disease or rheumatic infection. Rapid heart action was noted throughout disease. On 20th day soft mitral systolic bruit was first heard; as convalescence was established area of cardiac dullness was definitely enlarged. Apex beat in 5th space 1 inch beyond nipple line; bruit became more marked and was propagated towards left axilla. Examination of lungs invariably gave evidence of oedema, more marked at left base.

Patient was discharged as stretcher case on 70th day from onset of illness. Three months later I was informed he was suffering from mitral regurgitation

The points to be noticed in this case are:—

1. Occurrence of valvular disease and of necessity a damaged myocardium in case of true typhoid.
2. Throughout illness heart-rate was observed to be rapid.
3. Pulse-rate was rapid when observed during sleep.
4. Breathlessness was always present and arrest of respiration never exceeded 12 seconds.

Comment.—In above case of valvular and myocardial disease arising in a case of typhoid fever the heart-rate was observed to be unduly rapid in waking and sleeping states throughout. The arrest of respiration is less than that observed in healthy hearts. *The tachycardia is cardiac in origin.*

This type of tachycardia is due to toxic irritation or degeneration and consequent weakness of the myocardium, which necessitates an increased heart rate in order to maintain an efficient circulation; in addition there is considerable evidence that the heart muscle has been permanently damaged by the infection.

Tachycardia Toxic in Origin.

CASE 2.—Severe case of paratyphoid B (*B. paratyphosus B* in faeces). Pneumonic type, rapid heart action and rapid respiration were observed for a considerable time (4 weeks). On 15th day of illness tachycardia present might have been termed phasic as shown in polygraph tracing. A rate of 144 per minute alternated with a slower rate of 96 per minute, each phase occupying some 20 seconds. During this time patient was in critical condition, being semi-conscious for following week.

With a view to arresting the tachycardia 1/250 gr. of strophanthin was injected intravenously and within $\frac{1}{4}$ hour the higher rate was obliterated, but was observed to return 3 or 4 hours later; successive injections of strophanthin were given. Invariably the higher pulse-rate disappeared for a time. (Extreme difficulty was experienced in taking records, the rhythm is uncertain.)

By 22nd day the phasic tachycardia had vanished and with return of consciousness, convalescence was speedily gained, the lung condition cleared up, and an excellent recovery ensued.